Theories about Cryogenic weaponry, the acceleration of an isotope's half-life, and the diffusion of nuclear bombs,

Radioactive decay occurs when an atomic nucleus is bombarded with neutrons, thus creating an imbalance between the protons and neutrons within the nucleus. The neutrons then cause the atoms to split into 2 smaller atoms. The 2 smaller atoms subsequently release more neutrons. Those neutrons hit the 2 smaller atoms, which then causes each of those 2 atoms to split into 2 smaller atoms, which then leaves 4 smaller atoms altogether. Those 4 smaller atoms then subsequently release neutrons which hits each of those 4 smaller atoms causing all of those atoms to each split into two. This chain reaction simply continues and is what is called the fission process. This fission process of radioactive decay in which the atoms split into smaller atoms can be best understood by observing the atoms as the elements on the periodic table, where an element with a higher atomic number splits into 2 elements with lower atomic numbers. For example when Uranium 235 is bombarded by neutrons, it absorbs the neutrons and becomes Uranium-236 before it splits into one Krypton atom and one Barium atom, both of which have lower atomic numbers than Uranium.

When it comes to hypothesizing the opposite process to fission(radioactive decay generating tremendous heat energy), one can refer back to the fundamentals of plutonium production. During WWII, in the B reactor at the plutonium production site in Hanford, Washington, scientists bombarded Uranium with neutrons for several weeks before placing the extremely hot Uranium and its fuel elements in a pool of water behind B Reactor's core for cooling. During that time, Uranium decayed into plutonium and the radiation from the rest of the fission products subsided. The fission products are the increasingly smaller unstable elements that come about when the atoms split into smaller atoms during the fission process of Uranium being bombarded by neutrons. When the Uranium was stored in water, the Uranium 238(an isotope of Uranium) absorbed a neutron and became uranium-239. It then converted that neutron into a proton. Since the Atomic number of an element is its number of protons, the process of an atom converting a neutron into a proton validates identifying the atom as a new element. Since Uranium was the heaviest element at that time with the highest atomic number, a new element arising from a Uranium atom converting a neutron into a proton would be added to the periodic table. In this case, the new element was named Neptunium. Therefore Uranium- 239 became

Neptunium-239. Within 2.5 days, Neptunium-239 converted a neutron into a proton, which validated the identification of a new element called Plutonium or Plutonium 239 in this case. This process that took place while the Uranium fuel elements were being cooled allows us to hypothesize that unlike the heat generating radioactive decay that takes place in fission, a cold generating process would involve a chain reaction in which atoms are constantly converting a neutron into a proton and thus creating new elements in the process--elements that could only be identified and named from the final element that would come about at the end of that process. In order to track those new elements in this case of extreme cooling, one would have to place-after the extreme cooling process--those elements in a water storage that would bring those extremely low temperatures to normal temperatures. During a process such as that, radioactive decay would take place, leaving the water full of unknown elements that would have to be identified and named using solvent extraction techniques and spectroscopy.

A hypothesis on how a self sustaining chain reaction would continuously create new elements and emit a tremendous amount of cooling could be surmised through understanding the beta radiation process: Uranium-238 absorbs a neutron during fission and becomes Uranium-239, which then--after 23 minutes(in water storage)--beta decays and converts a neutron to a proton and becomes Neptunium239, which itself after 2.5 days(in water storage) does the same and becomes Plutonium-239. Plutonium-239 has a half-life of about 24,100 years before it would become Americium-239. However, upon absorption of 4 neutrons, plutonium-239 becomes plutonium 243, which has a half-life of 5 hours. If the uranium-239 was bombarded with neutrons during the water storage phase, the isotopes would continuously beta decay into new elemental isotopes with short half lives, thus more quickly emitting a tremendous amount of cooling. (The hypothesis is that the formation of new elements brings about cooling) Using Oxygen-15 labelled water, which is regular water, but with the oxygen atom replaced by oxygen-15 could possibly accelerate an isotope's half-life. The oxygen-15--as a a positron-emitting isotope--would create an environment that would help speed up the process by which each new isotope eventually releases an electron and converts the neutron into a proton. The idea behind this is that the presence of positrons(subatomic particles with positive charge) will exert an attractive pressure on the electrons of the atom, thus speeding up the process of its elimination from the atom, which would reduce the atom's half-life and conversion time

into becoming a new atom. Hypothetically harnessing this into a cryogenic explosion that could offset the massive radiation release of a nuclear bomb would require containing uranium-239 within an apparatus of deuteron bombardment of a nitrogen gas which creates oxygen-15. This would create the extreme cooling chain reaction with uranium239 becoming Neptunium, Neptunium becoming Plutonium, Plutonium becoming Americium...etc etc....presuming the Oxygen-15 solution would rapidly accelerate each element's half-life. Such an outcome would be making use of the philosophy of side one and side two of health being opposed to one another, but on a large scale. A nuclear explosion is posited as the side one reaction while a cryogenic explosion is posited as the side two reaction to offset it

Another possibility for nuclear defense is the isolation and use of Xenon-135-- a product of the Uranium-235 fission process that takes place in nuclear reactors. As a neutron absorber that often cools down nuclear reactors by absorbing the extra neutrons, Xenon-135's use in laser defense technology could poison the nuclear reaction of any atomic missiles that it comes in contact with. Through diffusion, the Xenon-135 gas could penetrate the missile. Theoretically at a high enough temperature and pressure, a Xenon-135 powered laser beam in contact with the target would(at the very least--keeping in mind that high powered laser beams destroy missiles) diffuse into the external components of the target and infect the fission elements within and thus reduce the chances of a proper nuclear fission reaction taking place when the missile eventually detonates.

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-sources

The Apocalypse Factory: Plutonium and the Making of the Atomic Age by Steve Olson